

Description of the Larva of *Copera tokyoensis* Asahina (Insecta: Odonata: Platycnemididae) from Korea

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ABSTRACT

The larval stage of *Copera tokyoensis* Asahina is described for the first time from Korea. The larva can be distinguished from other known larvae of *Copera* by the absence of lateral setae on the abdominal segments and by the labial palpal lobe, which bears three setae. Line-drawings of key characters and discussion on Korean *Copera* are provided.

Key words: *Copera tokyoensis*, *Copera annulata*, Platycnemididae, larva, description

INTRODUCTION

The damselfly family Platycnemididae is distributed in the Palearctic, Oriental, and Afrotropical Regions, including Madagascar Island. The family contains approximately 200 species in 26 genera (IDF, 2006). The genus *Copera* of Platycnemididae includes nine species and is distributed in East Asia and India; majority of the members occur in tropical Southeast Asia (Tsuda, 1991). Only two species of the genus, *Copera annulata* (Selys) and *C. tokyoensis* Asahina, are known in Northeast Asia (Ishida et al., 1988; Tsuda, 1991). Larvae of these two species are known inhabited ponds with abundant aquatic plants. Although *C. annulata* and *C. tokyoensis* have been reported in the Korean Peninsula (e.g., Kong, 1987; Asahina, 1989; Lee, 1996, 2001), their detailed locality data have not been provided and no larval stages and habitats are known in Korea.

We collected adults and larvae of *C. tokyoensis* in Gyeonggi-do area and successfully associated the adult and larval stages. We herein describe the larval stage with discussion on Korean *Copera*. All materials are housed in the Aquatic Insect Collection of Seoul Women's University (SWU-AIC) in Seoul.

DESCRIPTION

Copera tokyoensis Asahina

Copera tokyoensis Asahina, 1948: 103 [♂, ♀; Tokyo, Japan]; Ishida et al., 1988: 31 [♂, ♀, L; Japan; key]; Asahina, 1989: 13 [♂, ♀; Seoul, Korea]; Lee, 1996: 80

[catalogue]; Lee 2001: 55 [♀; Gyeonggi-do, Korea].

Material examined. KOREA: 1♂, 1♀ & 1 larva (with exuvium): Gyeonggi-do, Gwangmyeong-si, Haan-dong, Aegineung reservoir, 20 Jun 1998, J.W. Yum, SWU-AIC; 1 larva: Chungcheongnam-do, Taean-gun, Dooung marsh, 3 Jun 2002, J.W. Yum, SWU-AIC.

Larva. Body (Fig. 1A) length 18.2 mm; body surface hairy; general body color brown. Head 1.92 mm in length, 3.66 mm in width; general color brown. Postocular lobes protruded posteriorly with several warts. Labium (Fig. 1B) pale; prementum 1.80 mm in width, 2.58 mm in length (ca. 1.4 × width of prementum), yellowish, with 4 setae on horizontal line; palpal lobe with 3 setae (Fig. 1B), with a movable hook, a truncate lobe (Fig. 1C), and a terminal hook. Mesothorax with a brown process; apex of process blunt. Hindwingpads brown, 5.45 mm in length, reaching abdominal segment IV. Legs brown, relatively long, with dark brown stripes (Fig. 1A). Abdominal segments II-IX with carina on each side; carina without setae. Cerci triangular; apex of cerci blunt. Lamellae 14.1 mm in length (ca. 0.8 × length of body), 2.3 mm in width (ca. 0.16 × length of lamellae), with a long terminal filament, with dark brown spots marginally, without tracheal branches; mid-ribs of lamellae straight, without cutting (Fig. 1A, D).

Diagnosis. Larvae of *C. tokyoensis* can be distinguished from their congeners by the combination of the following characters: Lamellae are approximately 0.8 times length of the body (Fig. 1A); labial palpal lobe has three setae (Fig. 1B); abdominal segments II-IX have carina on each side and the carina lacks setae; cerci are triangular in shape and apically blunt; each lamella has a long terminal filament (Fig. 1D).

Habitat. The larvae of *C. tokyoensis* were found in small ponds and reservoirs in the southwestern part of Korean

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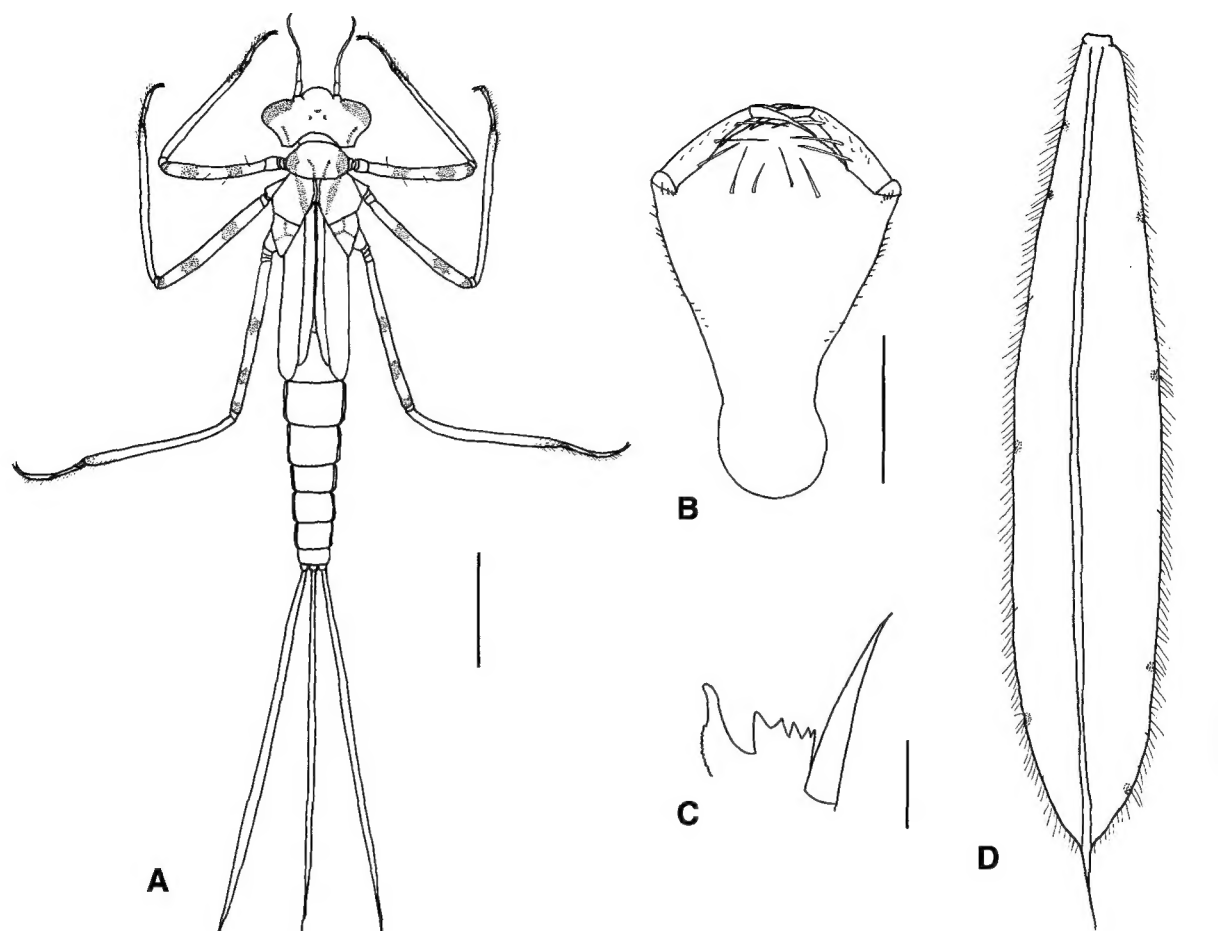


Fig. 1. Larva of *Copera tokyoensis*. A, whole body; B, prementum; C, palpal lobe; D, lamella. Scale bars=4 mm (A), 1 mm (B, D), 0.1 mm (C).

Peninsula. The ponds are approximately 30 m wide, 2 m deep, moderately turbid, muddy, and aquatic plants and algae are filled with most surface area. Abundant macrophytes found in the habitats are *Trapa pseudo-incisa*, *Leersia oryzoides* var. *japonica*, *Scirpus fluviatilis*, and *Zizania latifolia*.

DISCUSSION

Two species of *Copera* have been recorded in the Korean Peninsula. Doi (1943) recorded male and female adults of *C. annulata* from Taereung and Changdong in Gyeonggi-do, both of which currently belong to Seoul city area. However, Doi's material has not been preserved in any museums or institutions in Korea and Japan (S.M. Lee, personal communication) and few natural wetland habitats in Taereung and Changdong areas are preserved due to urbanization.

Kong (1987) (also see Yoon and Kong, 1988) reported the

larvae of *C. annulata* from 15 localities throughout South Korea, e.g., Gwangneung, Yongin, Seongnam, Siheung, Cheolwon, Danyang, Jecheon, Yeongdong, Dangjin, Waju, Imsil, and Suncheon. However, judging from the description and line-drawings of the larva of *C. annulata* by Kong (1987), e.g., length ratio between the body and lamellae, as well as from the examination of part of his material presently housed in the Aquatic Insect Collection of Seoul Women's University, the larvae are actually *Platycnemis phillopoda* Djakonov, a platycnemid damselfly commonly found in Korea. We herein officially correct this misidentification.

Lee (1996) collected female adults of *C. annulata* from Gwangneung in Gyeonggi-do and Lee (2001) provided line-drawings of female abdomen of *C. annulata* based on his female material. Lee's female adult material is currently housed in the National Central Museum in Daejeon, Korea. Although Lee had collected male adults of *C. annulata* from Hwanghae-do, North Korea, in 1950s (S.M. Lee, personal

communication), we were unable to confirm his male adult material of *C. annulata* in Korea.

Asahina (1989) recorded male and female adults of *C. tokyoensis* from Cheongnyangni in Seoul. Lee (2001) added sampling localities of the male and female adults of *C. tokyoensis*: Gwangmyeong-si in Gyeonggi-do, Gunsan-si in Jeollabuk-do, and Habcheon-gun in Gyeongsangnam-do. Up to date, however, no larval stage of *Copera* has been reported in Korea and this is the first record of the larval stage of *Copera* in Korea.

The larvae of Korean *C. tokyoensis* lack lateral tracheal branches in the lamellae, whereas those of Japanese *C. tokyoensis* have distinct lateral tracheae as seen in Ishida and Ishida (1985: Pl. 22, Fig. 4b) and Ishida (1996: Fig. 939). Detailed comparative studies are necessary when a large collection of the regional and local populations of this species is available.

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REFERENCES

- Asahina, S., 1948. A new species of Japanese damselfly (Platycnemididae, Odonata). Gekkam Mushi, 18: 103-106.
- Asahina, S., 1989. The Odonata of Korean Peninsula, a summarized review, part 1. Zygoptera. Gekkam Mushi, 220: 13.
- Doi, H., 1943. A list of Odonata from Chosen, with descriptions of 2 new species. Ent. Worl., 11(110): 162-181.
- International Dragonfly Foundation (IDF): <http://www.calopteryx.de/idf/> (accessed 1 December 2006).
- Ishida, K., 1996. Monograph of Odonata larvae in Japan. Hokkaido University Press, Sapporo, pp. 184-187, Fig. 27, 264, 467, 645, 939.
- Ishida, S. and K. Ishida, 1985. Odonata. pp. 59-60. In Kawai, T., ed., An Illustrated Book of Aquatic Insects of Japan. Tokai University Press, Tokyo, p. 59, Fig. 22(4).
- Ishida, S., K. Ishida, K. Kojima and M. Sugimura, 1988. Illustrated Guide for Identification of the Japanese Odonata. Tokai University Press, Tokyo, pp. 31-32, Fig. 13, 83.
- Kong, D.S., 1987. A Taxonomic Study on the Korean Dragonfly Larvae. Master's Thesis, Department of Biology, Korea University, Seoul, pp. 28-29.
- Lee, S.M., 1996. Dragonflies (Odonata) of Korean Peninsula. Bull. KACN, Korea, 15: 73-85.
- Lee, S.M., 2001. The Dragonflies of Korean Peninsula (Odonata). Junghaengsa, Seoul, pp. 55-56.
- Tsuda, S., 1991. A Distributional List of World Odonata. Takatani Type Press, Osaka, p. 53.
- Yoon, I.B. and D.S. Kong, 1988. Illustrated Encyclopedia of Fauna and Flora of Korea. Vol. 30. Aquatic Insects. II. Odonata. Ministry of Education of Korea, Seoul, pp. 217-218.

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